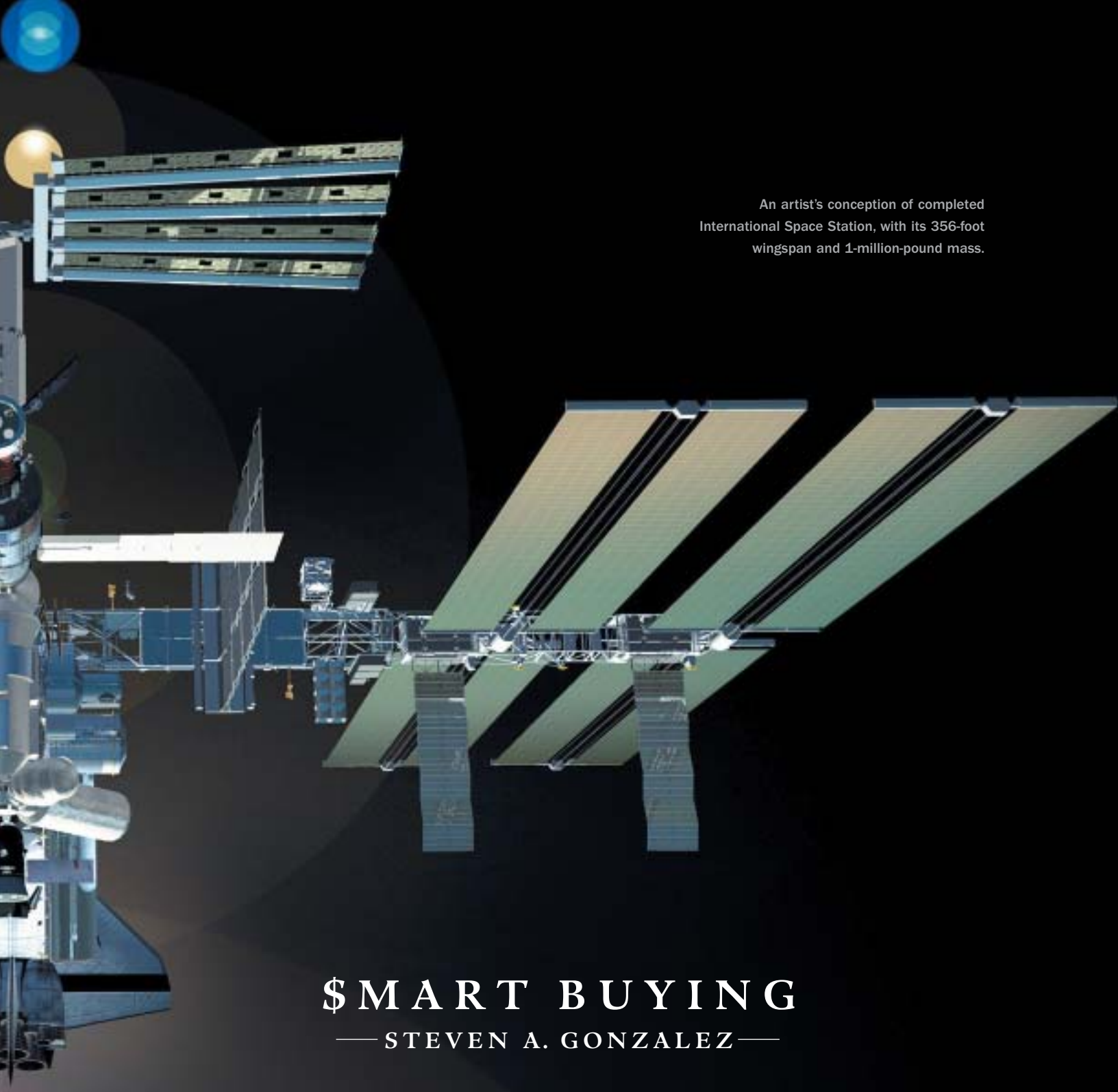

An artist's conception of completed International Space Station, with its 356-foot wingspan and 1-million-pound mass.

$MART BUYING

STEVEN A. GONZALEZ

When it came time to buy the next-generation data storage system for the Mission Control Center at Johnson Space Center, we asked our contractor who provides Control Center support to come up with a solution that would consolidate three current storage systems, as well as provide additional capability and functionality—all without spending vast amounts of money.

Eventually, the contractor's report arrived at my office. To my great disappointment, the proposed system came along with a multi-million dollar price tag. And, even more disappointing, the system relied on the same technology we already had in place and wouldn't deliver much additional functionality. It was clear that we needed to come up with a better solution—the best we could buy. But how do you buy the best technology, when you don't even know what technology is out there?

Technology changes often and staying aware of the latest technological developments is always a challenge. In this case, we needed to invest in an in-depth evaluation of potential solutions.

I realized that we had to learn first-hand to be better buyers, so I came up with the idea of inviting storage area network vendors to come on site and show us their capabilities and products. I hoped that by "test driving" the latest, greatest technology, our civil servants would be smarter buyers when it came time to choose a system.

We cleared out two rooms, reached agreements with several companies, and then, one-by-one, put their storage systems through the paces that would enable them to be installed at Mission Control—in essence, testing out a series of prototypes of the system we hoped to acquire.

Why would a company expend their own resources to temporarily install more than a million dollars of equipment at our technology lab? It allowed them to say that they had helped create a Mission Control Center prototype, and to tell potential clients that NASA was evaluating their equipment.

Our prototype project allowed us to better understand our requirements, before investing in a system. One of the things we learned about was clustering capabilities that would enable us to better support the Space Station's 24-hour operation. We had to have a storage system that could be reconfigured to a reduced environment so that the rest of the Control Center could be updated. We needed to be able to quickly move from one configuration to another, but didn't know how we could reduce the four hours required to do this. We discovered a clustering capability associated with some of the systems we tested that provided that capability and reduced the time dramatically.

INSTEAD OF SPENDING ABOUT $3 MILLION, WE SPENT $750,000 ON A STATE-OF-THE-ART SYSTEM IDEALLY SUITED TO MEET OUR CONFIGURATION REQUIREMENTS.

While our people were brought up to speed on the latest technologies available, the companies got a heads-up on our requirements. We used the prototypes to learn, and we told the companies that NASA and its contractor support would create the RFP that would go out for the new storage system based on what we had learned. We couldn't promise them anything, but it would give them a chance to see how their systems could be adapted to work in our particular environment. As it turned out, one of them did get work from the Mission Control Center contractor using the prototype concept they presented to us.

In the end, NASA got a better system for less money than had been thought possible. Instead of spending about $3 million, we spent $750,000 on a state-of-the-art system ideally suited to meet our configuration requirements. And in the process, we became smarter customers and smarter buyers of new technology. •

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Lessons

- Prototyping can be a key management and communication tool. Prototypes can increase the active participation of users in project definition.
- Using the products of different vendors allows the user to refine his or her objectives.

Question

What would it take on your projects to be a smarter buyer?

Clouds form the backdrop for the connected Zarya and Unity modules after their 1998 release from the Space Shuttle Endeavour's cargo bay.

Two years ago, **STEVEN A. GONZALEZ**'s story, "It's All About Passion" (*ASK 2*), described founding the Qualification and Utilization for Electronics Systems Technology (QUEST) lab with his fellow engineers at Johnson Space Center. The QUEST group sought to reinvigorate their passion for work by mapping out a path to NASA's future. About the lab's founding ideals, Gonzalez wrote, "The farthest reaches of the galaxy would forever be expanding as long as we had the imagination to see a way there.... Our mission, as we saw it, was to come up with a plan to achieve the infrastructure and technology that would make this vision a reality."

Today, Gonzalez serves as Chief of the Operations Research & Strategic Development Branch at Johnson, and his team continues to support the QUEST vision. Now called the Quest Innovations Lab and under the leadership of Tony Bruins, the group partners with private industry to bring cutting-edge technology to NASA at low cost.